Hiroyoshi OHASHI*: **Notes on some species of *Desmodium* and *Codariocalyx* from Himalaya (1)**

大橋廣好*: ヒマラヤのヌスビトハギ属 (広義) について (1)**

About 50 *Desmodium* species in a wide sense have hitherto been recorded from the Himalayan regions. These representatives were studied notably by Baker (in Hooker fil., The Flora of British India **2**: 161-175, 1876), by Prain (in Journ. Asiat. Soc. Beng. **66** (2): 387-401, 1897), and by Schindler (mainly in Fedde, Rep. Sp. Nov. Beih. **49**: 1-371, 1928), and their investigations revealed much of the taxonomic as well as floristic importance of the *Desmodium* (sens. lat.) plants in the region, but no further detailed work has been undertaken until recent years. Thus, more critical studies seems to be necessary.

Though still controvercial as to the generic delimitation of *Desmodium* (cf. Schindler, l. c.), in the present paper the genus *Desmodium* sensu stricto is adopted.

By the courtesy of Prof. Hiroshi Hara, the present writer had an opportunity to examine many specimens of *Desmodium* sens. lat. collected in Eastern Himalaya by the members of the Botanical Expeditions of the University of Tokyo in 1960 and 1963 and by Prof. Hara in 1964. This preliminary paper deals with some taxomic problems on three *Desmodium* species sens. lat., i.e., *D. nepalense* Ohashi, *D. kulhaitense* C. B. Clarke ex Prain and *Codariocalyx motorius* Ohashi (=*D. motorium* Merrill).

1) **Desmodium nepalense** Ohashi, sp. nov. (Figs. 1 & 2).

Frutex circa 150 cm altus, pilis appressis vel ascendentibus, fusco-bruneis et in novellis subsericeus. Caules plures a basi lignosa orientes, erecti, plus minusve striolati, sursum angulati, graciles, ramosi, pubescentes. Stipulae lanceolatae, 5 mm longae. Folia pinnatim trifoliata; petioli pubesentes 4-5 cm longi. Foliola subcoriacea, obovata-oblonga, apice obtusa vel subacuta, basi rotundata vel plus minusve cuneata, supra glabra, subtus appresse serices-pubescentia; nervis lateralibus validis 5-6 utrinsecus costam validam praedita, inter eos prominenter reticulata; foliolum terminale 3-5 cm longum, 2-3 cm latum; folia lateralia paullo minora, plus oblonga. Racemi terminales et axillares, densi, 5-10 cm longi; pedicelli filiformes, pro more 5 mm longi. Bracteae lanceolatae, ciliatae, scariosae, 5 mm longae. Calyx circa 3 mm longus, partim pubescens; tubus 2 mm longus; lobi superiores deltoidi, obtusi, 0.8 mm longi, inferiores lanceolati, subacuti, 1.2 mm longi. Corolla glabra; vexillum oblanceolatum, circa 7 mm longum et 2 mm latum; alae circa 6.7 mm longae; carina laviter incurva, circa 7 mm longa. Stamina diadelpha. Ovarium sessile. Legumen sessile, indehiscens, pro more 6-articulatum, plus minusve incurvum, margine supero incrassato vix constrictum, margine infero leviter constrictum, appresse pubescens; isthmi dimidio latitutine leguminis, paullo angustiores; articuli 3–4 mm longi, 2–3 mm lati, leviter reticulati. Semina matura circa 2 mm longa, 1.2 mm lata; hilum suborbiculare margine incrassatum.

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*Biological Institute, Faculty of Science, Tohoku University, Sendai. 東北大学理学部生物学教室.

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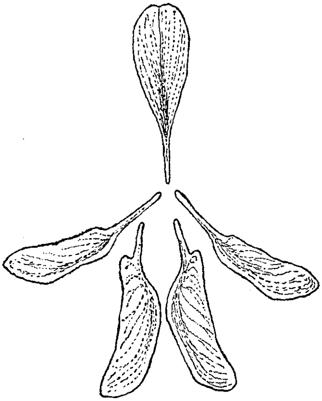

Fig. 1. Corolla of *Desmodium nepalense* Ohashi × 10/3.

Hab.: Nepalia orient. inter Garhi Danra et Tuwa, alt. 1800–2200 m (H. Hara, H. Kanai, S. Kurosawa, G. Murata, M. Tagashi et T. Tuyama; Nov. 4, 1963, fr.; Typus in Herb. Univ. Tokyoensis, TI-6301484); inter Tapejung et Garhi Kanra, alt. 1900-2200 m (H. Hara, H. Kanai, S. Kurosawa, G. Murata, M. Togashi et T. Tuyama; Nov. 3, 1963, fr.; TI-6301483).

Growing in open areas, roadsides, field margins or light thickets.

This new species is very distinct among *Desmodium* species hitherto recorded from the Himalayan region and its neighbouring areas, and is characterized especially by its oblanceolate standard and long spurred petals (Fig. 1).

Presumably, it has so far been identified as *Desmodium floribundum* (D. Don) G. Don, Gen. Syst. **2**: 297 (1832). Despite their some superficial morphological resemblances, however, *D. nepalense* Ohashi is easily distinguished from *D. floribundum* by less pubescent and angular branches, smaller leaflets and flowers, obtuse or subacute calyx-teeth, and the shape of standard, wings and keel. Furthermore, in *D. floribundum*, standard, wings and keel are clearly different in length from one another, while in this new species, *D. nepalense* Ohashi, all these petals are almost the same in length.

2) **Desmodium kulhaitense** C. B. Clarke ex Prain in Journ. Asiat. Soc. Beng. **66** (2): 395 (1897).

Prain described this species based on two sheets of fruiting specimens

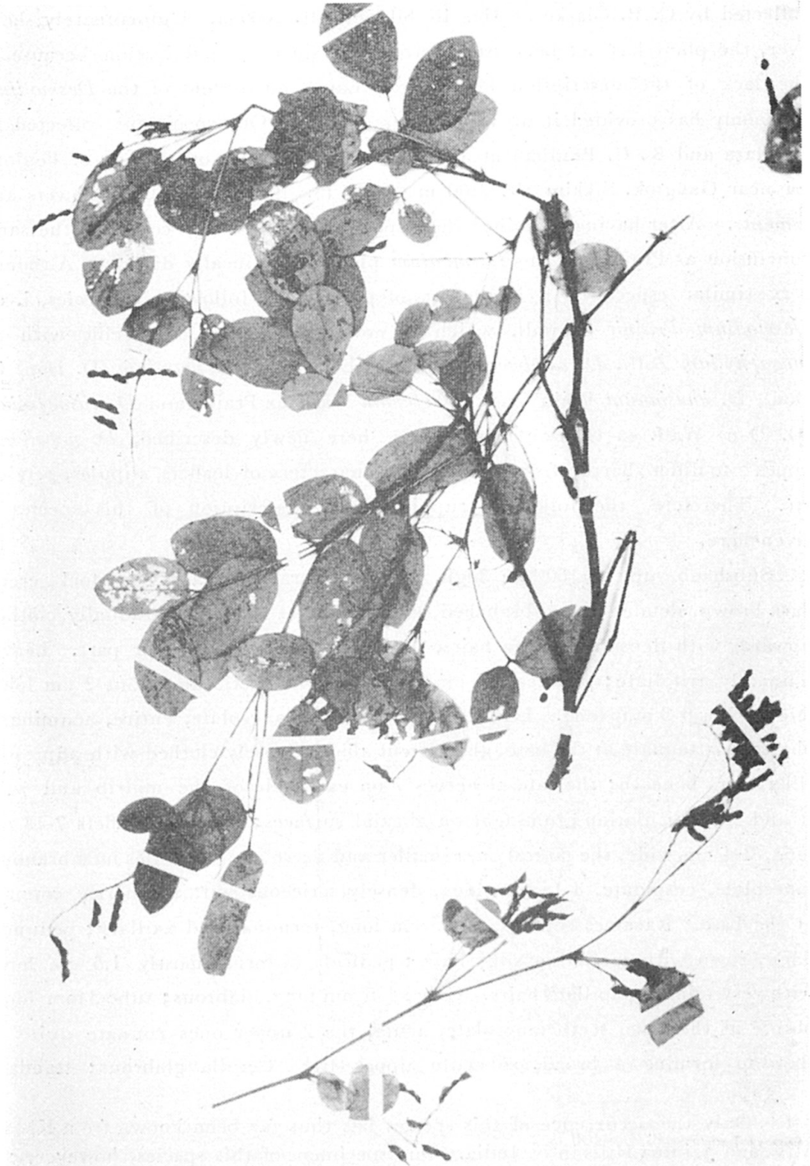

Fig. 2. The type specimen of *Desmodium nepalense* Ohashi ×2/5.

collected by C. B. Clarke at Hee in Sikkim, alt. 2000 m. Unfortunately, however, the plant has not been fully recognized since its publication because of the lack of the description of flowers. Later, no student of the *Desmodium* taxonomy has provided it up to the present time. Our specimens collected by H. Hara and K. C. Pradhan at an edge of the evergreen oak forests of Penlong La near Gangtok, Sikkim alt. 2100 m (Sept. 13, 1964), bear both flowers and loments. After having examined these specimens, the writer comes to the same conclusion as Prain that this *Desmodium* plant is specifically distinct. Although very similar especially in its nature of pods to the following 5 species, i. e., *Desmodium Prainii* Schindl. which is now regarded as conspecific with *D. megaphyllum* Zoll., *D. sambuense* (D. Don) DC. (=*D. floribundum* (D. Don) G. Don), *D. khasianum* Prain1), *D. serriferum* Wall. ex Prain, and *D. tiliaefolium* (D. D n) Wall. ex G. Don this species, here newly described, *D. nepalense*, appea to differ sharply from them in its characters of leaflets, stipules, petales, etc. Therefore, the following supplementary description of this species is given here.

Subshrub, up to 150 cm high. Stems several from a woody stock, erect, dark brown, slender terete, branched, glabrescent at the base, gradually clothed upwards with dense spreading hairs, slightly striate in the upper part. Leaves pinnately trifoliate; petioles 3–5 cm long; terminal petiolule about 2 cm long, lateral ones 0–3 mm long. Leaflets subcoriaceous, lanceolate, entire, acuminate, obtuse or attenuate at the base, glabrescent above, densely clothed with adpressed silky hairs beneath; the lateral nerves 7 on each side of the midrib and with it and the reticulation prominent on abaxial surfaces; terminal leaflets 7–13 cm long, 2–4 cm wide, the lateral ones smaller and narrower. Stipules membranous, lanceolate, cuspidate, 8–15 mm long, densely sericeous within, shortly connate at the base. Racemes copious, 12–25 cm long, terminal and axillary; peduncle dark brown with spreading silky hairs; pedicels filiform, mostly 1.5 cm long, with very minute papillate hairs. Calyx 4–5 mm long, glabrous; tube 3 mm long, obtuse at the base, teeth lanceolate, acute, the 2 upper ones connate quite to the top forming a broad, subacute upper lip. Corolla glabrous; standard

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1) Only the occurrence of this species has thus far been known from Khasia Mts. and Jaintea Hills in E. India. Our specimens of this species, however, are found in two localities in E. Nepal and these collections are new records from the Himalayan region.

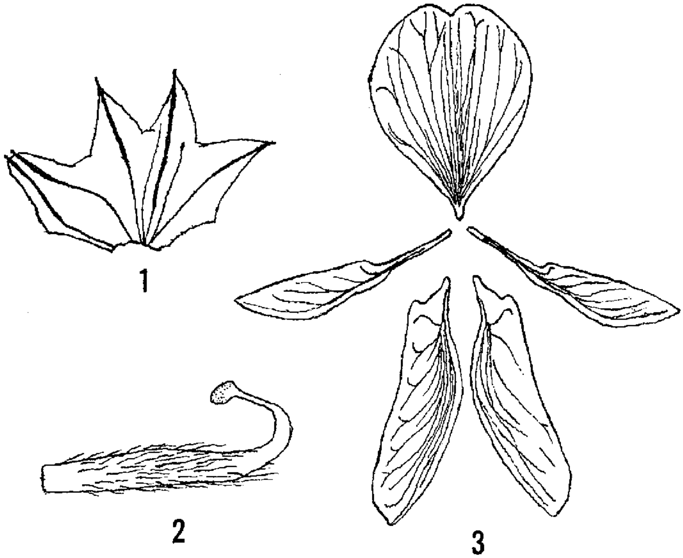

Fig. 3. *Desmodium kulhaitense* C. B. Carke ex Prain. 1. Calyx ×5, 2. Pistil ×5, 3. Corolla ×2.5.

suborbicular, contracted into a short but distinct claw at the base, about 10 mm long (including the claw) and 7 mm wide; wings lightly adhering to the keel, clawed and spurred, about 12 mm long; keel straight, slightly apiculate at the apex, about 13 mm long. Stamens diadelphous, upper one partially free, the other 9 connate as far as 3/4 their length; anther basifixed, extrorse, about 0.5 mm long. Ovary sessile, sericeous, style much recurved; stigma slightly club-shaped. Pods glabrous, sessile, 3.5–5 cm long, indehiscent, incurved, the upper suture thickend but scarcely constricted between the seeds, the lower margin slightly constricted as that the isthmus is about 2/3 as wide as the pod; segments 6–9 mostly 8 in number, oblong, 5–6 mm long, 3 mm wide, finely reticulate.

3) **Codariocalyx motorius** (Houtt.) Ohashi, comb. nov.

Hedysarum motorium Houttuyn, Nat. Hist. 2, **10**: 246 (1779).

H. gyrans L. f., Suppl. 332 (1781).

Desmodium gyrans (L. f.) DC., Prodr. **2**: 326 (1825); Miq., Fl. Ind. Bat. 1, **1**: 243 (1855); Baker in Hook. f., Fl. Brit. Ind. **2**: 174 (1876); Matsum. in Bot. Mag. Tokyo **16**: 75 (1902); Hayata, Icon. Pl. Formos. **1**: 185 (1911);

Gagnep. in Lecomt., Fl. Gén. Indo-China **2**: 584 (1920); Merr., Enum. Philip. Pl. **2**: 285 (1923); Craib, Fl. Siam. Enum. **1**: 407 (1928); Makino et Nemoto, Fl. Jap. ed. 2, 564 (1931); Masamune, List Vasc. Pl. Taiwan 72 (1954); Liu et Chuang in Taiwania no. 8, 79 (1962).

Codariocalyx gyrans (L. f.) Hasskarl in Flora **25**, Beibl. **2**: 49 (1842); Schindl. in Fedde, Rep. Sp. Nov. **20**: 280 (1924); in Fedde, Rep. Beih. **49**: 261 (1928); Hutchinson, Gen. Fl. Pl. 479 (1964).

Pseudarthria gyrans (L.f.) Hasskarl in Cat. Hort. Bog. 281 (1844); Pl. Jav. Rar. 391 (1848).

Meibomia gyrans (L. f.) O. Kuntze, Rev. Gen. **1**: 196 (1891).

Desmodium motorium (Houtt.) Merrill in Journ. Arn. Arb. **19**: 345 (1938); van Meeuwen in Reinwardtia **6**: 254 (1962).

var. **Roylei** (Wight et Arn.) Ohashi, comb. nov.

Desmodium Roylei Wight et Arnott, Prodr. **1**: 227 (1834).

D. gyrans var. *Roylei* (Wight et Arn.) Baker in Hook. f., Fl. Brit. Ind. **2**: 175 (1876).

Codariocalyx gyrans var. *Roylei* (Wight et Arn.) Schindler in Fedde, Rep. Sp. Nov. **20**: 281 (1924); in Fedde, Rep. Beih. **49**: 261 (1928).

The genus *Desmodium* in a wide meaning is morphologically heterogeneous to a considerable extent. The genus *Codariocalyx* here adopted is quite distinct from the genus *Desmodium* sens. str. Schindler (1924) circumscribed the genus *Codariocalyx* mainly basing upon the differences of loment characters. The present writer is in the same opinion as that of Schindler, so it becomes necessary to make a new combination as given above. The detaild circumscription of the genus *Codariocalyx* will be described in my forthcoming paper of the Asiatic genera belonging to trib. Desmodieae Hutchinson, Gen. Fl. Pl. 477 (1964).

Among our collections of this species from Eastern Nepal the specimens collected at an open area of the margin of thickets between Tuwa and Taplethok, alt. 1300–1600 m (Nov. 5, 1963; TI-6301447) and at a sunny place of the roadside of the field margin between Tharpu and near Changthaphu, alt. 900–1200 m (Nov. 26, 1963; TI-6301448) are referable to var. *Roylei*. This variety is easily distinguished from typical form, var. *motorius*, by its terminal leaflets, viz., in var. *Roylei* its terminal leaflets are subcoriaceous, narrow lanceolate, 8-13 cm long, and acute at the apex, while in var. *motorius* they are usually most commonly thick or somewhat membranous, narrow oblong or oblong-lanceolate, 3-7 cm long,

and obtuse at the apex.

The writer wishes to express his cordial thanks to Prof. Hiroshi Hara for his kind guidance and to Dr. Hiroo Kanai for his kind help.

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1） 原寛教授の御好意で東京大学のインド植物調査により得られた東部ヒマラヤでの採集品の一部を研究させていただいているうちに，ヌスビトハギ属の未知のものに気付いた。標本はすべて果実の時期のものであったが二三残っていた花を解剖してみたところ上に記載したように非常に変ったものであり，独立種として区別しておくことが適当であると考えた。ヒマラヤ中部の Simula から東部の N. Assam, 中国南部，台湾にわたり熱帯から温帯にかけて分布する *Desmodium floribundum* (D. Don) G. Don (=*D. sambuense* (D. Don) DC.) に莢が似ていて近縁とも思われるが，花弁 (図 1) をはじめ上述のような諸形質が全く異なっている。

2） *Desmodium kulhaitense* C. B. Clarke ex Prain はシッキムの暖帯林に特産する極く稀な種類ではないかと思われる。Prain (1897) はその原記載のノートで本種と近縁な次の 4 種，*D. sambuense* (D. Don) DC., *D. khasianum* Prain, *D. serriferum* Wall. ex Prain および *D. tiliaefolium* (D. Don) Wall. ex G. Don との異同について述べている (p. 395)。これらと共に，現在 *D. megaphyllum* Zoll. とみなされている *D. Prainii* Schindl. と名付けられたものも，本種と莢の形質が似ていることで近縁と思われるものである。しかしながら本種はこれらの *Desmodium* とは小葉や托葉の形，花柄の毛，花弁の形等で明らかに異なっているものである。本種については 1897 年に花を持たない 2 枚の標本に基づいて記載されて以来，少なくとも分類学的にはその後何らの検討も加えられていなかった。1964 年 Gangtok 附近で原寛教授が採集され持ち帰られた本種の標本は花，実共にそなえたものであったので，この機会にまず本種の特徴を，特に花部について，他の形質をも含めて明らかにすることが必要であると思われる。その結果は本文中に記載したとおりである。また本種の分類上の位置については Prain の扱いが適当であると考えられるが，今後更に多くの資料を用いて近縁な種類との間の類縁関係を再検討する必要があると思われる。

3） *Desmodium* は形態的に非常に変化に富んだ heterogeneous なグループであり，いくつかの属に細分することが必要であると思われる（この問題についてはいずれ報告したい）。Schindler (1924, 28) はこれを 13 属に分割したが，彼の system については再検討の必要がある。Schindler は主として莢が個々の article に分かれず，癒合したままでいて，下部が 2 片に裂開する性質を重視し，A.P. de Candolle の *Demodium* subsect. Gyrantia の一部，Bentham や Baker の *Desmodium* sect. Pleurolium の一部を，Hasskarl の用いた名前を生かして *Codariocalyx* にまとめた。この属はアジアとオーストラリアの熱帯から亜熱帯，時に暖帯にかけて分布し，2 種 1 変種から成る小群である。莢以外の形質をも考慮した結果，詳細は後にゆずるが，筆者も Schindler の扱いに賛成して *Codariocalyx* を採用する。したがって，従来一般には *Desmodium gyrans* (L. f.) DC. とされていた一種は，*Desmodium* として扱うならば *D. motorium* Merrill を用いるべきであるが，*Codariocalyx* では本文中に述べたような新組合せ，*C. motorius* Ohashi が必要となる。